LABORATORY AND

RESEARCH COMPLEX

SAFETY MANUAL

Ontario
Ministry
of the
Environment

HEALTH AND SAFETY GUIDE
FOR NEW EMPLOYEES

LABORATORY & RESEARCH COMPLEX

MINISTRY OF THE ENVIRONMENT

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HEALTH AND SAFETY GUIDE FOR NEW EMPLOYEES

MINISTRY OF THE ENVIRONMENT LABORATORIES COMPLEX

INTRODUCTION

The information in this guide has been prepared primarily to protect you and your fellow employees. Laboratory work includes occupational health risks for which protective measures can be taken. By following safe practices and procedures these risks can be minimized.

Staff co-operation is needed in observing safety rules and regulations and in reporting unsafe conditions or unsafe acts to your supervisor. All of us share the commitment to make your term of employment accident free. Each laboratory worker is responsible for his own personal safety performance. Always take time to do a work assignment safely. If you are uncertain of a procedure or think that what you are doing may be dangerous, ask your supervisor for advice or instructions.

Copies of the MOE Safety Manual are available in your section and the library. Take the time to read it - especially Part I (3d) which refers to the responsibility of the employee.

Senior staff, your Safety Committee and the Safety Office are committed to maintain and improve safe working conditions. Any suggestions you have, which will make the safety program more effective, will be welcome.

HEALTH SERVICE

Immunization, X-ray and other medical services are available to you without cost through the Employee Health Services Branch. Take advantage of these services to protect yourself - contact with contaminated laboratory samples may be injurious to your health. Immunization program is not compulsory but it is strongly recommended.

If you have physical disabilities or health problems advise the health nurse and your safety representative so that prompt assistance can be given to you in case of emergency.

In the event that you become ill at work, report to your supervisor and then to the Health and Safety Office. If necessary, arrangements will be made to obtain medical assistance or provide transportation to your home.

Regular medical check-ups are advised. Any change in your health or condition should be reviewed in conjunction with the type of work that you are engaged in. Constant headaches or a skin irritation may have an occupational origin. Some laboratory operations may be detrimental to pregnancies.

Should you be unable to attend work due to sickness or accident notify your supervisor or designated person as soon as possible. For some absences you may be required to produce a doctor's certificate, justifying the absence and/or a statement that you are fit to return to normal or light duties.

ARRIVING AT WORK

Travelling to and from work is the most dangerous act most of us do. Drive carefully on Resources Road and obey the 15 km/ph

speed limit. Ambulances and other vehicular traffic turning out of the Health Laboratories do not have a stop sign - pass with extreme caution. Watch for pedestrians crossing the laneway from the west parking lot.

PARKING

General staff parking is in the upper west lot. Protect your property by locking vehicle. Parking is free and at your own risk. Parking space in the rear quadrangle is reserved. No parking is allowed in the shipping and receiving area. The main entrance from the rear quadrangle is not to be used for loading or unloading of vehicles. Materials can be handled safely with less physical effort at the receiving dock.

VEHICLE ACCIDENTS

All accidents on Ministry property must be reported to your insurance company and to the police, if damage minimum is reached. In addition, notify your supervisor. Completion of Ministry accident forms may be required. The Safety Office will provide advice and assistance on request.

ORIENTATION AND SAFETY TOUR

A tour of the complex will be arranged for you during your first month of employment to give you knowledge of the layout of the north, east and west wings, the various types of work carried out and associated hazards, together with instruction on fire emergency evacuation routes and the use and location of common facilities and safety equipment.

Your supervisor will instruct you in safety practices within your work area and give you specific instructions on work procedures, precautions to be taken and identfication of local hazards.

PERSONAL INJURIES

MAJOR INJURY - in case of major injury to a co-worker contact the Health and Safety Centre in the north wing basement, telephone 3035 or 3015. Emergency assistance and transportation to medical facilities will be provided.

SERIOUS INJURY - have injured person escorted to the Health and Safety Centre for first aid, medical treatment or consultation.

MINOR INJURY - such as superficial cuts from non-contaminated material, surface abrasions or contusions, advise your supervisor and obtain treatment at the nearest first aid station. Report accident to the Safety and Health Centre.

ACID OR ALKALI BURNS - CLOTHING ON FIRE - call for help and use nearest emergency shower. Copious quantities of running water from eyewash fountain or full contents of a neutralite bottle must be used for eye injuries. Time is of the essence to prevent permanent injury. Report accident to the Safety and Health Centre.

INJURIES AFTER NORMAL WORKING HOURS - contact the security guard at the Main Desk - telephone 3035.

INJURIES DURING FIELD WORK - go to nearest hospital or local physician. Report accident to Safety and Health Centre.

BACK INJURIES - persons who slip or fall, or suspect that they may have strained or injured themselves whilst lifting heavy objects or performing unaccustomed work should report the fact to the Health and Safety Centre. Spinal injuries are not always readily apparent.

ACCIDENT REPORTING AND INVESTIGATION

Your co-operation is essential in reporting all accidents, occupational diseases and illnesses to the Health and Safety Centre, in order to comply with Workmen's Compensation and Occupational Health Acts that are designed for your protection and to ensure payment on your behalf of transportation, hospital or medical fees that may have been incurred.

Due to environmental and occupational hazards present in laboratories you are advised to consider all personal injuries reportable and potentially serious, even though the injury may appear trivial at the time. Always seek qualified medical attention for injuries - or suspected injuries - to the eyes, ears, nose or mouth, for the removal of embedded objects or any injury that may have future complications.

All accidents will be investigated to determine the cause and to find means of preventing a recurrence. Your assistance and suggestions can play a major role in accident prevention.

INCIDENT REPORTING AND INVESTIGATION

An incident which might have caused personal injury, fire, loss or damage, should not be dismissed as a"near-miss" and forgotten. Your report could prevent a future incident from happening of a magnitude that could lead to the loss of life or severe property damage.

SAFETY COMMITTEE

The name and work location of your section representative is posted on local noticeboards and in the Health and Safety Centre. Get to know your elected representative - you can help each other. The committee meet at regular intervals and make recommendations to management regarding safety and assist in establishing and maintaining a safe work environment. Your observations and comments will be welcome.

PROTECTIVE CLOTHING & SAFETY EQUIPMENT

Instruction and training in the care and use of any equipment, protective device or clothing required to be worn or used shall be given or arranged by your supervisor.

EYE PROTECTION

Your supervisor will specify areas of work in which you need eye protection and arrange issue of suitable safety glasses or goggles from stores. Wear fully-enclosed splash-proof goggles whenever handling injurious chemicals. The safest practice is to wear eye protection at all times in the laboratories.

HAND PROTECTION

The most common type of accident in our laboratories has been, in the past, injuries to the hand caused by glassware cuts, heat or acid burns.

The Lab Stores have a variety of gloves selected to protect your hands from acids, solvents, irritants, toxic substances, glass-handling, wet-washing, welding, heat or electrical contact. Pick and use the right kind for the right job. Check the specifications on the glove box before use.

Always test gloves for leaks before use. Get a pair that fits, gives a good grip and that provides wrist protection where necessary.

FOOTWEAR

Foot injuries are painful and take a long time to heal. The Occupational Health and Safety Act specifies that where toe or foot injury may occur from a falling or moving object or a puncture by a sharp object safety footwear shall be worn. Where foot injury may occur from a hot, corrosive or other material, or a hot workplace, adequate foot protection shall be worn.

Opentoed shoes, sandals or sneakers should not be worn on the job. Wear safety shoes or sturdy, low-heeled enclosed shoes for general laboratory work. In some jobs, such as material-handling and driving or where specified by the supervisor, the wearing of shoes may be a mandatory requirement.

LABORATORY COATS

Select full length size from stores stock and wear with sleeves down to protect forearms. Bands or sleeve protectors can be worn for jobs where loose sleeves may be hazardous. Coats which become contaminated by spillage of samples or chemicals should be exchanged. Do not wear coats in cafeteria, auditorium or designated eating areas.

GENERAL ATTIRE

Wear clothing suitable for your job. Rubber aprons and other protective clothing is obtainable from stores. Loose clothing, trouser cuffs, dangling ties or uncovered long hair can be hazardous in laboratories or near moving machinery. Rings and jewelry should not be worn when handling chemicals, especially in a fume-hood.

EYEWASH FOUNTAINS AND SAFETY SHOWERS

Do you know where your eyewash fountain and safety shower is? Plan your course of action ahead of time. Keep both free from obstructions - you may need to get to them in a hurry. Some areas are equipped with Neutralite bottles - make sure they are full and not placed near a chemical bottle that could be used in error during an emergency. If you wear contact lenses let your supervisor know so that suitable precautions can be taken.

FIRST AID STATIONS - LOCAL

A co-worker who has a St. John's First Aid Certificate is in charge of the first aid box in your work area. Introduce yourself. His knowledge may save your life. Take first aid training when you get an opportunity. Be able to help!

SPILL KITS

Kits for caustic, flammable solvents, acids and special chemicals are mounted in wall cabinets at strategic points. If you are first at the scene of a spill, call for help. Trained and experienced laboratory personnel will supervise the containing and clean-up of spills in a safe and approved manner.

RESPIRATORY EQUIPMENT

Self-contained respiratory equipment is stored and maintained in the Health and Safety Centre and is to be used for the rescue of staff by designated and trained personnel only. Canister-type masks may be used during spill clean-ups or during laboratory work of short duration by persons working under the direct control of a supervisor, who is fully aware of the hazards involved and the limitations of the canister.

HAZARDOUS SUBSTANCES

Section safety rules must be observed during handling or exposure to hazardous substances which may include volatile, flammable or toxic solvents, pesticides, bacteria and viruses, strong acids or alkalis, radioactive materials, mercury or samples containing poisons such as cyanide or arsenic compounds, mineral dusts or nuisance particulates. You cannot know too much about the hazardous materials you are handling. If in doubt, ask!

The sample originator or sample receptionist will affix warning labels to samples known or suspected of containing a hazardous substance. Whether marked or not, all samples should be handled with caution. Over-filled sample jars may be potential unexploded bombs due to gas generation and temperature change. Do not unscrew cap without taking precautionary measures to protect yourself and other persons in the area.

When acids, volatile solvents or other hazardous chemicals are withdrawn from stores, use bottle-carriers and/or carts for their transportation. Protect bottles from collision or falling. Never carry acids or solvents up or down stairwells.

CARCINOGENS

The effect of exposure or contact with most hazardous substances is immediate and obvious - discomfort, pain, injury, fire or explosion. Effect of exposure to carcinogens is not readily visible but it can be insidious and in the longterm lead to illness and possible death.

Avoid direct contact, inhalation or ingestion of carcinogens. Known or suspected carcinogens such as asbestos, benzene, beryllium, chloroform, chromates of lead and zinc, dimethyl hydrazine, dimethyl sulphate, PCB's and vinyl chloride, etc., will be labelled, stored, processed and disposed of according to local directives.

PIPETTING

All pipetting must be done by means of an aspirator bulb. Pipetting by mouth is not permitted.

LIFTING AND CARRYING

Proper methods of lifting and carrying protect you against injuries - especially back injuries - and make the job easier. Do not attempt to lift heavy or awkward items alone - get help or use of a mechanical lifting device operated by trained personnel.

When lifting moderately heavy objects, feet should be shoulder width apart, one foot beside and the other behind the article to be lifted. Bend your knees, do not stoop. Keep your back straight. Lift by pushing up with the legs, using your strongest muscles. Keep arms and elbows close to your body.

GLASSWARE-HANDLING

Never use glassware which is cracked, chipped or damaged. When inserting tubing or rod through stoppers select correct bore, wet both stopper and tubing, wear safety glasses and gloves. Do not apply force directly with your hand to remove a seized stopper from a flask. If there is personal hazard involved in dismantling or repairing glassware, it is sometimes safer and cheaper to discard the glassware. Seek advice from your supervisor first! Only experienced designated personnel will perform glassworking or fire-polishing work.

Broken glass in work areas is to be swept up with a banister brush and pan. Small pieces can be picked up with a piece of wet cotton. Don't take a short cut by using your hand.

Acid or solvent washing of glassware is performed by trained staff wearing adequate protection in a well-ventilated area. Be sure of the location of your nearest eyewash fountain and safety shower. You should be aware of all the potential hazards in your job.

MATERIAL-HANDLING

Carts or trays must not be overloaded by vertical double-layering of bottles or by leaving apparatus or packages protuding over edges. Pushing and pulling two carts at once can cause an accident. After emptying a cart, remove any debris or spillage and wipe surfaces clean ready for next person's use.

Platform trucks are designed for carrying heavy loads. Pallets not in use must be laid down and stacked. When pushing carts or other wheeled transporters into elevators, check matching of elevator base with floor level first. Always turn corners with caution and never run in corridors or work areas.

COMPRESSED GASES

Whenever cylinders are moved within the laboratories - full or empty - they must be securely strapped to a cylinder cart and the protective cap must be in place. At point-of-use in laboratories they must be strapped to a firm support in an upright position in a location which will not create a potential hazard or obstruct means of egress, fire or safety installations.

Always place cylinders away from sources of heat or ignition. Improper storage can result in leaks, fires or explosions. Do not store incompatible gases together - flammables, oxidants or corrosives. Check labels and instructions on cylinders to identify contents and determine safe storage and handling procedures.

Leaking, unidentified or defective cylinders are extremely hazardous. They must be marked as such and isolated pending pick-up by supplier. Never tamper with a valve, safety nut or stem-packing nut, or use a cylinder without an approved-type regulator. Use only tools designed for use with cylinder accessories, correctly sized and in good condition.

ELECTRICAL DANGERS

Electrical equipment must be CSA or Ontario Hydro approved. Repairs or modifications to laboratory portable electrical equipment must be performed by authorized staff or contractors.

All requirements for electrical work on fixed equipment, building fixtures or power supply lines must be referred to Ministry of Government Services. Do not tamper with electrical panels, switches or wiring or attempt temporary repairs or hook-up. Wait for an authorized and qualified representative of MOG's to do the work.

Make sure all electrical equipment you use is grounded. In some hazardous areas explosion-proof fittings may be required-check it out first! Static electricity can cause ignition of flammable solvents. Ground drums and dispensing containers, use sparkproof tools and maintain room humidity levels. Report electrical hazards to your supervisor immediately.

WASTE DISPOSAL

The co-operation of staff is needed to ensure waste is disposed of in a manner which will not cause injury to persons or damage to property or the environment and in compliance with all Government regulations.

CLEAR GLASS bottles that cannot be re-used are rinsed to remove chemical hazards and caps are removed prior to breaking up and returned to glass company for re-cycling. Wear eye protection when breaking glass.

SOLID WASTES of a non-hazardous nature are collected by housekeeping staff from receptacles daily. Do not place materials in receptacles which may be hazardous to cleaning staff or which may become dangerous when mixed with other solid wastes in the disposal hopper.

LIQUID WASTES which cannot be disposed of safely by neutralization, dilution or other methods must be sent to the storage area prior to transportation to an approved disposal site. Containers are limited to a maximum size of one gallon and contents must be clearly and fully identified in accordance with current directives.

PATHOLOGICAL WASTES must be autoclaved or rendered harmless by other means prior to final disposal.

SPECIAL WASTES that present risk of poisonous gases, fire, explosion , personal health or environmental hazards will be disposed of in an approved manner by arrangement between laboratory management and appropriate authorites.

HOUSEKEEPING AND STORAGE

Good housekeeping and storage practice is a basic part of accident and fire prevention. Keep benches, cupboards and work areas in a neat and orderly condition. Keep enough supplies for your daily needs - do not overstock chemicals and create a fire and explosion hazard.

Store materials out of aisles; do not block doorways, windows, lights, fire or safety equipment. Minimum width for walkways is 22 inches. Keep floors free from materials that could be tripping or slipping hazards such as cartons, bottles, cords and tubing, or grease or water. Never store corrosive chemicals at or above eye level. Avoid wedging doors open - most laboratory doors are designed to be closed for your safety and the benefit of the heating, ventillation and cooling systems.

Spilled toxic or corrosive chemicals must be cleaned up immediately. Keep benchtops and sinks wiped down and free from cluttered loose objects. Clean up your work place at the end of each day or after finishing a job. This is part of your responsibility.

Locker rooms are provided for your convenience. Keep them free from contaminated clothing or discarded materials. Keep your personal locker clean and secure.

FOOD AND BEVERAGE

Food or beverages are not to be kept or consumed within active laboratory areas - use the cafeteria and restroom facilities provided. Never use laboratory glassware as drinking containers. Swallowing of chemicals may occur from exposure to air contaminated with dust or fumes - or by picking up the wrong glass. The risk of contamination is far too great to store food or beverages in laboratory

refrigerators that house chemicals and samples.

SMOKING

Smoking is forbidden in chemical storage areas, elevators, auditorium and other areas designated by no smoking signs. Obey local regulations in laboratory areas. The danger from fire or explosion cannot be stressed too strongly. Flammable and explosive vapours can travel along the floor or be distributed by air currents to areas far from the dispensing bench or point of origin.

Smoking is further controlled in some laboratory rooms due to smoke contamination of samples during analysis.

Many samples contain bacteria, viruses or toxic substances. Care should be taken to avoid touching your face with cigarettes, pipes, or by chewing pencils, or with hands that may be contaminated.

LABELLING

One of the greatest hazards in a laboratory is unmarked or improperly labeled chemicals. Always check the label at the time of receipt, before use and before disposal. Chemicals received from suppliers usually have identity, formula, manufacturing date, hazards, and precautions in handling, use, storage and disposal means clearly indicated.

Each time a chemical is transferred from an original container to another one it too must be properly labeled. Chemical solutions prepared in the laboratory must be labeled or tagged and identified in legible print.

Chemicals of unknown stability and thoses which may deteriorate with age must have preparation dates shown on the label. Chemicals such as ethers which may form peroxides and explode, must be marked with date of stores issue and date of opening.

The labelling of samples in process and substances for waste disposal is equally important

ELEVATORS

Use freight elevators only for carts or when carrying materials that may be hazardous to passengers. Push carts in first - do not allow doors to close on carts or other non-flexible objects. Never cover "magic eyes" with tape to hold the elevator. This may cause a serious malfunction or accident.

If you should become trapped inside the elevator keep calm - there is no danger. Lift the telephone receiver and wait for instructions. Give nature of emergency, and elevator number. Telephone is connected to 24 hour call and maintenance service.

If you are outside the elevator and hear the alarm bell, contact Ministry of Government Services (3921 or 3570) and tell the person(s) inside the elevator that help is on the way. Do not use mechanical force to open doors, or tamper with the elevator power mechanism. Wait for the arrival of a qualified elevator constructor or authorized MOG's representative who will take necessary and safe action.

VISITORS

General public, touring parties, salesmen and maintenance staff are frequent and welcomed visitors to the Resources Road complex. They must observe the safety rules of the section that they are in. You can help to protect them by ensuring that they are not exposed to infections or contaminated materials, that they are aware of no smoking zones and that they are loaned safety glasses for use in hazardous areas.

OFFICE SAFETY

As an office or clerical worker you enjoy a relatively safe work environment - provided that you play your part in keeping it that way.

Always load filing cabinets from the bottom up and only open one drawer at a time to avoid hitting, tripping or toppling. Never empty ashtrays in wastepaper baskets before you leave the office. A fire could start and spread without early discovery.

Chairs with wheels or casters are not designed to stand on - use a safety stepstool to reach drawers or shelving units. If you can't reach you materials with a stepstool then it's time to review your storage methods.

Chemicals used in the operation or cleaning of duplicating machines, typewriters and other office equipment should be stored separately and be securely capped. Fumes could be hazardous and skin contact should be avoided. Avoid licking gummed surfaces - use a moistener. Remove staples with a staple remover, not your fingers. Safety catch must be set when paper cutters are not in use. The blades, springs and alignment need regular maintenance for accurate, easy and safe operation.

Ensure all electrical connections are grounded and CSA or Ontario Hydro approved. Never use damaged or frayed cords - have them replaced immediately. Check with the electrician before plugging new office electrical equipment into wall or floor receptacles. In case of an electrical fire use a carbon dioxide, halon or "C" rated extinguisher. Never use water.

Desk tops should be cleaned regularly and kept free from unprotected sharp objects - letter openers, knives, blades, pins etc. Keep them covered or in containers. Telephones

should be disinfected periodically, especially those in common use.

Your eyesight is one of your most valuable possessions - have a regular check-up and wear glasses if you need them. Position your desk to take the most advantage of natural or artificial lighting.

Posture when sitting at your desk is important to your health. Adjust chair height and back rest to your size; sitting with knees higher than pelvis reduces strain on your back. Physical movement helps to relieve stress, strain and tiredness. Stretch and move around a little when you can - you'll feel refreshed.

FIRE PROTECTION

Ministry of Government Services supply, maintain, test and inspect all fire protection equipment. Environment staff must take all possible precautions to prevent fires or explosions. Defective, missing or used fire equipment must be reported to MOG's without delay.

A list of fire wardens is posted in your section. Check with your warden today and find out your escape routes in case of emergency. Most laboratories are equipped with dry chemical or carbon dioxide fire extinguishers suitable for use on small electrical or chemical fires, or to create a path for you in escaping the fire area. Know where your extinguishers are, read the instructions and know how to use them. Attend the next Ministry training and demonstration course.

Fire hose and water extinguishers in hallway cabinets are mainly for the use of trained fire fighters during a major fire. Do not use water extinguishers on electrical fires. The north wing

basement is the only part of the complex protected by an overhead water sprinkler system.

21% of lab fires are due to electrical causes
20% of lab fires are due to flammable liquids
56% occur after six p.m. and before six a.m.

Do a shutdown and safety check before you leave each day.

FIRE PROCEDURE

SHOULD A FIRE OCCUR:

1. call for help
2. turn in alarm
3. attempt to extinguish fire
4. Personnel should ensure that they are safely between the fire and the exit.
5. Avoid fighting a fire alone.
6. If fire cannot be contained, evacuate the area.

WHEN ALARM SOUNDS:

1. A CONTINUAL ring means that the fire or hazard is in your area.
2. All persons in area must be evacuated via designated stairwell.
3. Do not use the elevators.
4. Fire Wardens will check that area has been cleared, and station themselves in stairwells to prevent persons from returning.
5. Persons having direct knowledge of the fire location and associated hazards should await the arrival of the fire brigade outside the building and provide them with information.
6. Personnel must not re-enter the fire zone until the "all clear" has been authorized by the Fire Dept. and announced on the P.A. system by the Safety Officer or a responsible person. (note- the bells stop ringing automatically after 2 minutes - this does not mean that the danger is over.)

WHEN ALARM SOUNDS:

1. An Intermittent ring means that the fire or hazard is not in your area.
2. Stay where you are. Be alert and listen for further bells or public address announcements.
3. Your fire warden will obtain information and issue any necessary instructions.
4. Do not use telephones. Lines may be needed to deal with the emergency.

NOTES

- Do not telephone the fire brigade. This is done automatically by the Power House staff when the alarm is triggered.
- Location of fire is shown on the panel in the main lobby as well as in the power house.
- Activation of the fire alarm shuts off the ventilation system but not the fumehoods.
- Lab chemical or instrumentation work that could become dangerous if unattended should be shut-down - time permitting. Remember that preservation of life is the prime consideration.
- During an alarm, elevators switch to emergency power, which enables persons in the elevator at the time of the alarm to travel to the lower floor and exit safely.

EMERGENCY HAZARDS

In case of spread of fumes - acids, poisons, solvents, flammable or poisonous gases - or the potential risk of the spread of any type of contamination or personal hazard, take action as follows:

1. Call for help and warn others
2. Evacuate the room or area.
3. Notify 3015 or 3035 in order that MOG's can be advised to adjust the ventilation system and environment safety team can take suitable action.

4. Set off fire alarm in danger zone.
5. Do not re-enter the contaminated area until instructed to do so by authorized personnel.

EMERGENCY TELEPHONE NUMBERS

Lab Health & Safety Centre	3015 or 3035
Ambulance	489-2111
Fire	231-1111
Police	361-1111
Hospital, Humber Memorial	249-8111
Poison Information Centre, Hospital for Sick Children	597-1500
Poison Information Centre, East General Hospital	461-8272
Health Centre, MTC Downsview	3496
Health Centre, Ministry of Health Labs	3101
Power Plant	3570
Security Guard station after hours	3035

HAVE A SAFE DAY!